

May 31, 2016

CURRICULUM VITAE

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ORGANIZATION: Department of Commerce
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PRESENT POSITION: Scientist X – stock assessment and modeling
Contractor with Ocean Associates, Inc.

EDUCATION: Ph.D. National Taiwan University (2008) in Oceanography
M.S. National Taiwan University (2002) in Oceanography
B.S. National Taiwan Ocean University (2000) in Fishery Science

EXPERIENCE:

2014-present	Scientist X – stock assessment and modeling, Southwest Fisheries Science Center, La Jolla, CA
2009-2014	Senior Fishery Scientist, Pacific Islands Fisheries Science Center, Honolulu, HI
2008-2009	Fishery research biologist, Southwest Fisheries Science Center, La Jolla, CA
2006	Research assistant, Overseas Fisheries Development Council, Taipei, Taiwan
2005-2006	Visiting scholar, Southwest Fisheries Science Center, La Jolla, CA

RESEARCH INTERESTS:

Population dynamics, Stock assessment modeling, Simulations, Fisheries Biology

HONORS AND AWARDS:

Awarded NOAA Team Member of the Month for July 2011

PUBLICATIONS:

- McDaniel, J., K.R. Piner, **H.H. Lee**, K. Hill. (In review). Evidence that the migration of the northern subpopulation Pacific sardine (*Sardinops sagax*) off the west coast of the United States is age-based. *PLOS ONE*.
- Lee, H.H.**, L.R Thomas, K.R. Piner, and M.N. Maunder. (In review). Effects of age-based movement on the estimation of growth assuming random-at-age or random-at-length data. *Journal of Fish Biology*.
- Piner, K.R., **H.H. Lee**, and M.N. Maunder. 2016. Evaluation of using random-at-length observations and an equilibrium approximation of the population age structure in fitting the von Bertalanffy growth function. *Fisheries Research*. 180:128-137. DOI: <http://dx.doi.org/10.1016/j.fishres.2015.05.024>
- Chang, Y.J., J.M. O'Malley, J. Brodziak, **H.H. Lee**, and G. DiNardo. 2015. Model selection uncertainty and multi-model inference in the generalized fishery production modeling: simulation study of the Pacific blue marlin and WCNPO striped marlin stocks. *Fisheries Research*. 166:129-139. DOI: <http://dx.doi.org/10.1016/j.fishres.2014.08.023>
- Lee, H.H.**, K.R. Piner, M.G. Hinton, Y.-J. Chang, A. Kimoto, M. Kanaiwa, N.-J. Su, W. Walsh, C.-L. Sun, and G. DiNardo. 2014. Sex-structured population dynamics of blue marlin *Makaira nigricans* in the Pacific Ocean. *Fisheries Science*. 80:869-878. DOI: <http://dx.doi.org/10.1007/s12562-014-0762-6>
- Wang, S.-P., M.N. Maunder, K. Piner, A. Aires-da-Silva, and **H.H. Lee**. 2014. Evaluation of R0 profiling as a diagnostic for selectivity curve structure in integrated stock assessment models. *Fish. Res.* DOI: <http://dx.doi.org/10.1016/j.fishres.2013.12.009>
- Lee, H.H.**, K.R. Piner, R.D. Methot, and M.N. Maunder. 2014. Use of likelihood profiling over a global scaling parameter to structure the population dynamics model: an example using blue marlin in the Pacific Ocean. *Fish. Res.* DOI: <http://dx.doi.org/10.1016/j.fishres.2013.12.017>
- Lee, H.H. et al.** 2013. Stock assessment of blue marlin in the Pacific Ocean in 2013. CIE review document. <http://isc.acaffrc.go.jp/pdf/ISC13pdf/Annex%2010-%20Blue%20marlin%20stock%20assessment.pdf>
- Thomas, L.R., G. DiNardo, **H.H. Lee**, K.R. Piner and S.E. Kahng. 2013. Factors influencing the distribution of Kona crabs *Ranina ranina* (Brachyura: Raninidae) in the main Hawaiian Islands. *Journal of Crustacean Biology*. 33(5): 633-640. DOI: <http://dx.doi.org/10.1163/1937240X-00002171>
- Piner, K.R., **H.H. Lee**, I. Taylor, M. Kanaiwa, and C.-L. Sun. 2013. Population dynamics and status of striped marlin (*Kajikia audax*) in the western and central North Pacific Ocean. *Marine and Freshwater Research*. 64: 108-118. DOI: <http://dx.doi.org/10.1071/MF12302>
- Lee, H.H.**, K.R. Piner, R. Humphreys, and J. Brodziak. 2012. Stock assessment of striped marlin in the western and central North Pacific Ocean. CIE review document. http://isc.acaffrc.go.jp/pdf/Stock_assessment/ISC-BILLWG%202011%20Stock%20Assessment%20of%20Striped%20Marlin.pdf
- Lee, H.H.**, M. Maunder, K.R. Piner and R.D. Methot. 2012. Can steepness of the stock-recruitment relationship be estimated in fishery stock assessment models? *Fisheries Research*. 125-126:254-261. DOI: <http://dx.doi.org/10.1016/j.fishres.2012.03.001>
- Lee, H.H.**, M. Maunder, K.R. Piner and R.D. Methot. 2012. Reply to 'The reliability of estimates of natural mortality from stock assessment models'. *Fisheries Research*. 119-120:154-155. DOI: <http://dx.doi.org/10.1016/j.fishres.2012.02.015>
- Piner, K. R., **H.H. Lee**, M. Maunder and R.D. Methot. 2011. A simulation-based method to determine model misspecification: examples using natural mortality and population dynamics models. *Marine and Coastal Science*. 3:336-343. DOI: <http://dx.doi.org/10.1080/19425120.2011.611005>
- Lee, H.H.**, M. Maunder, K.R. Piner and R.D. Methot. 2011. Estimating natural mortality within a fisheries stock assessment model: an evaluation using simulation analysis based on twelve stock assessments. *Fisheries Research*. 109:89-94. DOI: <http://dx.doi.org/10.1016/j.fishres.2011.01.021>
- Lee, H.H.** and C.C. Hsu. 2008. Abundance index for the longline fishery targeting spawning bluefin tuna (*Thunnus thynnus*) in the southwestern North Pacific Ocean. *Fisheries Science*. 74(6):1336-1338. DOI:

<http://dx.doi.org/10.1111/j.1444-2906.2008.01661.x>

- Lee, H.H. and C.C. Hsu. 2003. Population biology of the swimming crab, *Portunus sanguinolentus*, in the waters off northern Taiwan. *Journal of Crustacean Biology*. 23(3): 691–699. DOI: <http://dx.doi.org/10.1651/C-2358>
- Huang, H.W., C.C. Hsu, H.H. Lee, and Y.M. Yeh. 2003. Stock assessment of albacore, *Thunnus alalunga*, in the Indian Ocean by surplus production models with a new relative abundance index. *Terrestrial, Atmospheric and Oceanic Sciences*. 14(2): 201-220. (SCI)
- Huang, H.W., Y.M. Yeh, H.H. Lee, and C.C. Hsu. 2003. A considerable approach to incorporate oceanographic data into abundance index standardization for bigeye tuna population in the Indian Ocean. *Acta Oceanographica Taiwanica*. 41(1): 13-32. (in Chinese with English abstract)

REPORTS:

- Lee, H.H., K.R. Piner, 2016. Development of a Pacific Bluefin stock assessment. The ISC Pacific Bluefin tuna Working Group Workshop, La Jolla, CA, USA. February 29- March 11, 2016. ISC/16/PBFWG-1/06.
- Lee, H.H., K.R. Piner, L. Heberer, and J.M. Suter. 2015. US commercial and recreational fleets catch and associated composition data. The ISC Pacific Bluefin tuna Working Group Workshop, Kaohsiung, Taiwan. November 18-25, 2015. ISC/15/PBFWG-2/06.
- Lee, H.H., K.R. Piner, M.N. Maunder, and R.D. Methot, Jr. 2015. Simulation of methods of dealing with age-based movement in PBF stock assessment. The ISC Pacific Bluefin tuna Working Group Workshop, Kaohsiung, Taiwan. November 18-25, 2015. ISC/15/PBFWG-2/12.
- Chang, Y.J., B. Langseth, H.H. Lee, and J. Brodziak. 2015. Stock projections for the western and central North Pacific Ocean striped marlin stock. ISC/15/BILLWG-2/1.
- ISC BILLWG. 2015. Stock assessment update for striped marlin (*Kajikia Audax*) in the western and central North Pacific Ocean through 2013. Available at: http://isc.ac'affrc.go.jp/pdf/ISC15pdf/Annex%2011_WCNPO_STM_ASSESSMENT_REPORT_2015_10Aug15.pdf
- ISC SHARKWG. 2015. Indictor-based analysis of the status of shortfin mako shark in the North Pacific Ocean. Available at: [http://isc.ac'affrc.go.jp/pdf/ISC15pdf/Annex%2012_SMA%20stock%20assessment%20report%20\(2015\)%200Jul15_changes%20accepted.pdf](http://isc.ac'affrc.go.jp/pdf/ISC15pdf/Annex%2012_SMA%20stock%20assessment%20report%20(2015)%200Jul15_changes%20accepted.pdf)
- Lee, H.H., F. Carvalho, and K.R. Piner. 2015. Simulation testing of stock indicators. The ISC Shark Working Group Workshop, Shimizu, Japan, March 9-17, 2015. ISC/15/SHARKWG-1/06.
- Lee, H.H., K.R. Piner, S.L.H. Teo, and S. Kohin. 2014. Standardized catch rates of shortfin mako shark in the U.S. West Coast drift gillnet fishery. The ISC Shark Working Group Workshop, Puerto Vallarta, Mexico, November 19-26, 2014. ISC/14/SHARKWG-3/09.
- Carvalho, F., Lee, H.H., Y.J. Chang, and G. DiNardo. 2014. Developing and testing a state-space production model for the shortfin mako shark in the North Pacific Ocean. The ISC Shark Working Group Workshop, Puerto Vallarta, Mexico, November 19-26, 2014. ISC/14/SHARKWG-3/13.
- Lee, H.H., Chang, Y.-J., Hinton, M.G., Piner, K.R., Tagami, D., Taylor, I., and Kai, M. 2013. Blue marlin stock assessment in the Pacific Ocean. The ISC Billfish Working Group Workshop, Shimizu, Japan, May 20-28, 2013. ISC/13/BILLWG-2/04. Available at: http://isc.ac'affrc.go.jp/pdf/BILL/ISC13_BILL_2/ISC_13_BILLWG-2_WP4.pdf
- Chang, Y.J., J. Brodziak, H.H. Lee, G. DiNardo, and C.L. Sun. 2013. A Bayesian hierarchical eta-analysis of blue marlin (*Makaira nigricans*) growth in the Pacific Ocean. The ISC Billfish Working Group. Honolulu, Hawaii, January 16-23, 2013. ISC/13/BILLWG-1/02.
- Lee, H.H. and Y.J. Chang. 2013 Age-structured natural mortality for Pacific blue marlin based on meta-analysis and

an ad hoc mortality model. The ISC Billfish Working Group. Honolulu, Hawaii, January 16-23, 2013. ISC/13/BILLWG-1/07.

Walsh, William, Y.J. Chang and **H.H. Lee**. 2013. Catch statistics, size composition, and CPUE standardization for blue marlin *Makaira nigricans* in the Hawaii-based pelagic longline fishery in 1995-2011. The ISC Billfish Working Group. Honolulu, Hawaii, January 16-23, 2013. ISC/13/BILLWG-1/13.

Lee, H.H. and K.R. Piner. 2012. Future projections of the Western and Central North Pacific striped marlin stock. The 9th Regular Session of the Commission, Western and Central pacific Fisheries Commission. December 2-6, 2012. WCPFC9-2012-IP18.

Lee, H.H., K.R. Piner, and I. Taylor. 2012. Future projections of the Western and Central North Pacific striped marlin stock. The ISC Billfish Working Group. April 2-9, 2012. ISC/12/BILLWG-2/2.

Piner, K.R., **H.H. Lee**, I. Taylor, and G. DiNardo. 2011. Preliminary Striped marlin stock assessment. The ISC Billfish Working Group. Dec 6-16, 2011. ISC/11/BILLWG-3/01.

Lee, H.H., L.H. Teo, S. Kohin, J. Ianelli, and I. Taylor. 2011. Preliminary Population Analysis of North Pacific Albacore Based on the Stock Assessment Program Stock Synthesis 3. The ISC Albacore Working Group. Jun 4-11, 2011. ISC/11/ALBWG/03.

Brodziak, J., **H.H. Lee** and M. Mangel. 2011. Probable Values of Stock-Recruitment Steepness for North Pacific Albacore Tuna. The ISC Albacore Working Group. Jun 4-11, 2011. ISC/11/ALBWG/11.

Walsh, William and **H.H. Lee**. 2011. Standardization of Striped Marlin (*Kajikia audax*) CPUE with Generalized Linear Models fitted to Pelagic Longline Observer Data from the Hawaii-based Fishery in 1995–2009. The ISC Billfish Working Group. Honolulu, Hawaii, January 19-27, 2011. ISC/11/BILLWG-01/08.

Piner, K. and **H.H. Lee**. 2011. Meta-analysis of striped marlin natural mortality. The ISC Billfish Working Group. Honolulu, Hawaii, January 19-27, 2011. ISC/11/BILLWG-01/10

Lee, H.H. and J. Brodziak. 2011. Investigation of the association between Hawaii deep slope bottomfish CPUE and environmental variables. 106th Meeting of the Scientific and Statistical Committee. 6.B.1(5)

Piner, K.R. and **H.H. Lee**. 2011. Estimation of bottomfish CPUE using the delta method and HDAR logbooks 1948-2010. 106th Meeting of the Scientific and Statistical Committee. 6.B.1(4)

Teo, L.H., **H.H. Lee**, and S. Kohin. 2010. Time series associated with albacore fisheries based in the Northeast Pacific Ocean. The ISC Albacore Working Group. La Jolla, USA, October 12-19, 2010. ISC/10/ALBWG-03/02.

Lee, H.H. 2010. Estimating input sample size for length-frequency data in Stock Synthesis: US longline and US troll fisheries. The ISC Albacore Working Group. La Jolla, USA, October 12-19, 2010. ISC/10/ALBWG-03/03.

Piner, K.R. and **H.H. Lee**. 2010. Review of biological reference points with specific recommendations for North Pacific Billfishes. The ISC Billfish Working Group. Hakodate, Japan, April 15-22, 2010. ISC/10/BILLWG/08.

Teo, L. H., **H.H. Lee**, and S. Kohin. 2010. Spatiotemporal characterization and time series of the US albacore troll fishery in the North Pacific. The ISC Albacore Working Group. Shimizu, Japan, April 20-27, 2010. ISC/10-1/ALBWG/05.

Aires-da-Silva A., M. Maunder, R. Deriso, K.R. Piner and **H.H. Lee**. 2009. A Sensitivity Analysis of Alternative Natural Mortality Assumptions in the PBF Stock Assessment. The ISC Pacific Bluefin Tuna Working Group. Kaoshiung, Taiwan, July 10-11, 2009. ISC/09/PBF-1/01.

Lee, H.H. and R. Conser. 2009. Preliminary Population Analysis of North Pacific Albacore Based on the Stock Assessment Program Stock Synthesis 3. The ISC Albacore Working Group. Shimizu, Japan, April 14-21, 2009. ISC/09-1/ALBWG/05.

Piner, K.R. and **H.H. Lee**. 2008. The Estimate of Unfished Bluefin Spawning Stock Biomass: the result of density-dependent processes? The ISC Pacific Bluefin Tuna Working Group. Ishigaki, Japan, December 10-17, 2008. ISC/08/PBF-2/01.

Piner, K.R., **H.H. Lee**, M. Maunder and A. Aires-da-Silva. 2008. Simulation of the Estimation of M as a Model mis-

specification diagnostic. The ISC Pacific Bluefin Tuna Working Group. Ishigaki, Japan, December 10-17, 2008. ISC/08/PBF-2/02.

Lee, H.H., K.R. Piner, C.C. Hsu and R. Conser. 2008. Estimation of population size for Pacific bluefin tuna using Bayesian production models. The ISC Pacific Bluefin Tuna Working Group. Ishigaki, Japan, December 10-17, 2008. ISC/08/PBF-2/03.

Aires-da-Silva, A., M. Maunder, R. Deriso, K. Piner and **H. H. Lee**. 2008. An Evaluation of the natural mortality schedule assumed in the PBF 2008 stock assessment and proposed changes. The ISC Pacific Bluefin Tuna Working Group. Ishigaki, Japan, December 10-17, 2008. ISC/08/PBF-2/04.

Takeuchi, Y., M. Ichinokawa, M. Kai, K. Oshima, M. Abe, K. Yokawa, R. Conser, K.R. Piner, A. Aires-da-Silva, **H.H. Lee**, and M. Dreyfus. 2008. Stock assessment of Pacific bluefin tuna – Specification of modeling and base case results. The ISC Pacific Bluefin Tuna Stock Assessment Working Group. Shimizu, Japan, May 28 - June 4, 2008. ISC/08/PBF-1/17.

Lee, H.H. and C.C. Hsu. 2007. Abundance index for the small-scale longline fishery targeting spawning bluefin tuna (*Thunnus orientalis*) in the southwestern North Pacific Ocean. The fifth ISC meeting of the Pacific Bluefin Tuna Working Group. Shimizu, Japan, April 16-23, 2007. ISC/07/PBF-WG/25.

Chang, S.K., **H.H. Lee** and H.I. Liu. 2007. Standardization of South Atlantic swordfish by-catch rate for Taiwanese longline fleet. *International Commission for the Conservation of Atlantic Tunas, collective Volume of Scientific Papers*. 60(6): 1974-1985. SCRS/09/120.

Lee, H.H. and C.C. Hsu. 2006. New abundance index for the small-scale longline fishery targeting spawning bluefin tuna (*Thunnus orientalis*) in the southwestern North Pacific Ocean. The fourth ISC meeting of the Pacific Bluefin Tuna Working Group. Shimizu, Japan, January 16-20, 2006. ISC/06/PBF-WG/14.

Piner, K.R., R. Conser, **H.H. Lee** and S. Hoyle. 2006. Evaluation of the use of the fully integrated length-structured stock assessment model Stock Synthesis II for use in modeling Northern Bluefin Tuna. The fourth ISC meeting of the Pacific Bluefin Tuna Working Group. Shimizu, Japan, January 16-20, 2006. ISC/06/PBF-WG/20.

Lee, H.H., C.C. Hsu and P. Crone. 2005. Critical Evaluation of Abundance Indices for North Pacific Albacore Caught by the Taiwan Longline Fishery, 1995-2003. International Scientific Committee Albacore Working Group Meeting. La Jolla, CA, USA, November 28-December 2, 2005. ISC-ALBWG/05/14.

Hsu, C.C. and **H.H. Lee**. 2005. Standardized catch per unit effort of bigeye tuna (*Thunnus obesus*) caught by Taiwanese longline fleets in the Atlantic Ocean. *International Commission for the Conservation of Atlantic Tunas, collective Volume of Scientific Papers*. 58(1): 192-207. SCRS/04/137.

Lee, H.H., Y.M. Yeh, and C.C. Hsu. 2004. Age specific abundance indices for the Indian Ocean albacore caught by the Taiwanese longline fishery, 1980-2002. The first meeting of the Working Party on Temperate Tunas. Shizuoka, Japan, August 2-5, 2004. IOTC-WPTMP-2004-05.

Lee, H.H. and C.C. Hsu. 2004. Age specific abundance indices for North Pacific albacore caught by the Taiwanese longline fishery, 1995-2002. Intersessional Meeting of North Pacific Albacore Workshop. Taipei, Taiwan, July 20-22, 2004. NPALB-inter-2004-05.

Hsu, C. C. and **H. H. Lee**. 2003. Catch, effort and standardized catch per unit effort for the eastern Atlantic and Mediterranean bluefin tuna stock caught by Taiwanese longline fishery up to 2001. *International Commission for the Conservation of Atlantic Tunas, collective Volume of Scientific Papers*. 55(3): 1172-1189. SCRS/02/102.

Hsu, C.C. and **H.H. Lee**. 2003. General linear mixed model analysis for standardization of Taiwanese longline CPUE for Bigeye tuna in the Atlantic ocean. *International Commission for the Conservation of Atlantic Tunas, collective Volume of Scientific Papers*. 55(5): 1892-1915. SCRS/02/121.

Lee, H.H. and C.C. Hsu. 2002. Length-weight relationships of albacore (*Thunnus alalunga*) from western and central North Pacific Ocean. *Eighteen North Pacific Albacore Workshop. California, USA*. NPALB/02/INF08.

Hsu, C.C., **H.H. Lee**, Y.M. Yeh and H.C. Liu. 2001. On the targeting problem, partitioning fishing effort and estimating abundance index of bigeye tuna for Taiwanese longline fishery in the Indian Ocean. *Third Working Parties of Tropical Tunas, Indian Ocean Tuna Commission. Victoria, Seychelles*. WPTT/01/04.

OTHERS: